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The Liar Paradox: A Case of Mistaken Truth Attribution

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Abstract
A semantic solution to the liar paradox ("This statement is not true") is presented in this article. Since the liar paradox seems to evince a contradiction, the principle of non-contradiction is preliminarily discussed, in order to determine whether dismissing this principle may be reason enough to stop considering the liar paradox a problem. No conclusive outcome with respect to the value of this principle is aspired to here, so that the inquiry is not concluded at this point and the option to explore an alternative, semantic, solution remains open. This proposed solution is focused on what the liar paradox expresses and what it fails to express.

Keywords Liar paradox · Sorites paradox · Paraconsistent logic · Semantics

1 Introduction

Several solutions have been proposed to the liar paradox, and the way in which it is approached sometimes reveals something about one's frame of reference. The main purpose of this modest paper is to propose a way out of it that is relatively simple and straightforward compared to some other perspectives that have been presented. I will focus on a semantic aspect of the paradox, raising the question what is actually stated when the liar paradox is formulated. This issue is raised in Sect. 4, following preliminary inquiries in Sects. 2 and 3. After some basic points have been presented in Sect. 2, the third section discusses the principle of non-contradiction, which is necessary in order to determine whether this principle may itself be an—unwarranted—impediment in the search for a solution.

This article does not present an overview of the various (sorts of) paradoxes. Apart from the fact that there is not sufficient room for such an undertaking, there is no need to do so. With respect to the liar paradox itself, I will also only discuss those aspects which are relevant for this inquiry.

An example of a paradox is: "I am the man with no name". The speaker is supposed to have no name, yet he may be said to have the name 'the man with no name'.

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(Supposing that a definite description applies here, so that there are no other men who refer to themselves as nameless.) The liar paradox may be formulated as "This statement is false", or as "This statement is not true". It resembles the following paradox: "I know that I know nothing", or "It is certain that nothing is certain." There are reasons, which will be presented in Sect. 4, to relativize the similarity between these examples. The solution to the liar paradox, I will argue, is to be found by analyzing its specific formulation.

2 The Liar Paradox

What is characteristic of a paradox is difficult to grasp, perhaps not in the least on account of the different types of paradoxes that may be distinguished. Still, a sufficiently general qualification may capture what is at issue. Quine defines a paradox straightforwardly as "… just any conclusion that at first sounds absurd but that has an argument to sustain it …" (Quine 1966, 3). Pleitz's definition is: "A *paradox* is an argument that appears to be valid from premises that appear to be true to a conclusion that appears to be unacceptable" (Pleitz 2018, 18). Similar definitions are presented by Restall[1] and Sainsbury.[2] (I will not problematize the difference between 'acceptable' and 'true' here.)

Priest's position differs from these in one respect, as he says: "A paradox is an argument with premises which appear to be true and steps which appear to be valid, which nevertheless ends in a conclusion which is false" (Priest 1979, 220). The difference, as becomes clear from the quote, is that no *seemingly* or *apparently* false (or unacceptable) conclusion is at issue, but one that *is* false. Yet the matter at hand is difficult enough already, and discussing this issue here would yield little more than an aside.

With respect to the liar paradox in particular, two varieties may be distinguished: the simple liar paradox and the strengthened liar paradox.[3] The simple liar paradox is self-referentially false, and may be expressed as "This statement is false",[4] while the strengthened liar paradox is "This statement not true". The strengthened liar paradox is the version that will be the focus of attention of the fourth section.

Before inquiring the particular aspects of the liar paradox I consider decisive, however, it is important to tackle another issue. The problem of the liar paradox is that it contains a contradiction. This observation raises two questions. First, what is the *nature* of a contradiction? This issue will be discussed in the next section. Second, what *sort* of contradiction may be involved? Is the contradiction an 'internal'

[1] Restall (1993, 281): "A paradox is a seemingly valid argument, from seemingly true premises to a seemingly unacceptable conclusion.".

[2] Sainsbury (2009, 1): "This is what I understand by a paradox: an apparently unacceptable conclusion derived by apparently acceptable reasoning from apparently acceptable premises.".

[3] For a detailed analysis, see Pleitz (2018, 57–60).

[4] The term 'statement' is used here rather than 'sentence'. At this stage of the inquiry, 'statement' (or, alternatively, 'proposition') seems more apt than 'sentence', since not all sentences are declarative, but for reasons that will become presented in Sect. 4 this difference is in this case moot.

one (like the one manifested in the principle of non-contradiction (PNC),[5] where one may, in other words, in order to (try to) resolve the issue, restrict oneself to a solution trough formalization), or an 'external' one, meaning that the PNC conflicts, or at least appears to conflict, with a state of affairs (in whatever way one may define 'state of affairs')? This issue is also relevant for what is discussed in the next section, but its import extends further, as will become apparent in Sect. 4.

3 The Relevance of the Principle of Non-contradiction

The idea that the liar paradox is a problem is predicated on the idea that contradictions are problematic. The latter idea seems easy to grasp: it is difficult, if not impossible, to see how a proposition and its negation could (simultaneously) be true (see, for example, Sainsbury (2009, 152)). This given does not amount to a proof of the PNC, of course; all it does is point to an epistemological limitation. Yet this is not, in and of itself, reason to *reject* the PNC; it merely means that one may doubt whether it is justified to (invariably) *accept* it.

The question that presents itself, then, is what basis there is to conclude that the PNC is true. There seem to be two options for its supporters: it is maintained that it is a priori true or the claim that it is true has a basis in experience. The meaning of 'truth' is not clear, but it is not my intention to delve into this issue here, if only on account of the fact that it would be unwarranted and presumptuous to believe I could add something valuable in a few lines to such a complex matter.

Fortunately, though, there is no need do so, save for a short epistemological exploration in the next section. What matters here is merely that those who hold that the PNC is true need to prove why this is the case, which is an especially difficult challenge if this is itself considered an axiom,[6] and thus the third option in Albert's Münchhausen trilemma (the other options being an infinite regress and a logical circle) (Albert 1991, 15).

This challenge does not, of course, decide the issue of the nature of the PNC and it does not, in and of itself, preclude the option to maintain that the PNC does not have a basis in experience. Yet if one simply states that the PNC is true without knowing that it is universally true, and is thus true in all (possible) cases, it is dogmatically accepted (cf. Bueno and Colyvan 2006, 170). The reply to such an objection that the PNC must be universally true because one cannot imagine that this would *not* be the case is an obvious *argumentum ad ignorantiam*.

An a priori solution may not be available. Those who would defend the first option, and thus accept the premise that no empirical evidence can be brought forth to corroborate the truth of the PNC (or invalidate it), may counter by pointing out that intuitively it does not *require* any empirical support: it is not necessary to

[5] Expressed in propositional logic through '¬ (p ^ ¬ p)'.

[6] Cf. Drieschner (1977, 418): "An axiomatic formalism may exhibit the structure of logic rather clearly, but it cannot easily serve as a justification of logic since its deductions employ logic themselves.".

examine a sufficient number[7] of apples to be able to conclude that an apple cannot be (completely) red and not (completely) green. Still, one may, *contra* this position, argue that such an example manifests precisely what one eschews, since it is based on experience; it cannot be ruled out that apples (or other objects) that *do* exhibit properties that conflict with the PNC exist, unless there is a non-empirical basis to appeal to the truth of the PNC.

Should the apple example come across as (too) outlandish and/or far-fetched, it is worthwhile to consider a field of research that has yielded some results that may be hard to dismiss in a discussion such as the present one. Quantum superposition, for example, appears difficult to explicate, at least in terms of classical physics. With respect to the topic under discussion, it may be noted that certain phenomena that are studied in quantum mechanics appear to conflict with the PNC.

How should this state of affairs be assessed? Putnam's perspective is radical: "We must now ask: what is the nature of the world if the proposed interpretation of quantum mechanics is the correct one? The answer is both radical and simple. *Logic is as empirical as geometry.* It makes as much sense to speak of 'physical logic' as of 'physical geometry'. We live in a world with a non-classical logic" (Putnam 1975, 184; cf. Arnold and Shapiro 2007, 278). Importantly, if quantum mechanics is considered to be the equivalent of classical physics, in the sense that what is described on the atomic and subatomic levels is a representation of what exists, this renders support to the idea that contradictory properties are part of reality (Da Costa and De Ronde 2013, 848)[8] (leaving the issue here how 'reality' is to be defined).

As a consequence, it is warranted to hold that logical principles may stand in need of revision on the basis of empirical findings, and even that logical principles (such as the PNC) have an empirical basis [Bueno and Colyvan (2006, 158)]. Revisiting the apple case, all that can be said is that one may notice that a particular apple is not (completely) red and not (completely) green and perhaps, on the basis of inductive reasoning, that this is true of all apples (or even all macroscopic objects). *Starting* with the PNC as a principle would, from this perspective, amount to reversing the proper order of inquiry by *assuming* that a—possible—outcome *must* be correct, which is not observed as long as no case in which the PNC is not true has been found and which proves problematic if the outcome turns out not to correspond with certain findings.

These considerations provide a basis to question the universal truth of the PNC. As long as that which could be accepted on an a priori basis ran parallel with the empirical results (of classical physics), there may not have been a reason to question the justification of the claim of the existence of such a basis, but once the empirical results (of quantum mechanics) started to deviate from it, there was a reason to reconsider either domain (or both).[9] Accordingly, one may say: "Classical logic is

[7] The issue what a *sufficient* number would be is raised if inductive reasoning is the norm; it need not be explored here.

[8] These authors finally present a nuanced position, though, not considering paraconsistent logic to be the ultimate (or only true) system of logic (Da Costa and De Ronde 2013, 856).

[9] Ironically, this is only problematic if the PNC is *accepted*, for those who do not deem contradictions

a simple formalism that has difficulty with accounting for all the facts, but became popular. It is not *prima facie* superior to all other logical systems" (Restall 1993, 296).

Priest even goes so far as to say that "… the truth is that, by and large, philosophers have done nothing but assume, usually dogmatically, the law of non-contradiction (in the sense in question)" (Priest 1984, 154). As a dialetheist, he accepts contradictions, including the logical paradoxes (Priest 1984, 172). Indeed, taking seriously findings such as those presented above means that one would have to reconsider, or at least reflect on, the meaning of the logical paradoxes: "The reasons for supposing the logical paradoxes to be true contradictions are at least two-fold. The major reason is that all attempts to treat them as anything else have been singularly unsuccessful, or at any rate a good deal less successful than the present proposal" (Priest 1984, 153).

Against what has been argued it may objected that this does not do justice to the nature of the PNC. Tahko considers it as 'a fundamental metaphysical principle' (Tahko 2009, 32) and 'a true metaphysical principle concerning the world' (Tahko 2009, 35). The basic idea is the following: "At its simplest, the metaphysical interpretation of LNC [the law of non-contradiction] amounts to this: the entities of the mind-independent reality are plausibly governed by some sort of principles (as otherwise there would be no order in our experience of them), that is, there are some constraints as to what kind of properties a certain kind of entity can and cannot have, and further, some of these properties are mutually exclusive. For instance, a particle cannot both have and not have a charge at the same time, or an object cannot be both green and red all over at the same time. It seems that reality just *is* such that it conforms to the law of non-contradiction" (Tahko 2009, 33).

The author points out, first, that there are various interpretations of quantum mechanics, there being no consensus with respect to the question of what the right interpretation is, and, second, that it is not clear whether quantum mechanics is incompatible with the PNC (Tahko 2009, 43). This only means, however, that the possibility cannot be ruled out that the findings of quantum mechanics are not compatible with the PNC, and not that it is clear that it is necessary that they *are* compatible with it, for the latter claim would require a separate proof.

He maintains that even if it were granted that the truth of the PNC cannot be said to be observed on the microphysical level, that given would not detract from its manifestation on the macrophysical level, to which he refers as 'the deep structure of the world' (Tahko 2009, 43). It is difficult, though, to see how the conclusion may be avoided that empirical considerations rather than one or more metaphysical convictions are decisive, since experience is apparently accepted as a criterion (no contradictions have (at least as yet) been observed on the macrophysical level, but they *do* (possibly) occur on the microphysical level). It is, of course, positive that certain

Footnote 9 (continued)
problematic would presumably also accept them where the issue that the two domains conflict in this respect is concerned.

findings are incorporated into one's account, but one must not shun away from the possibility that doing so brings with it the need to reconsider such convictions.

Furthermore, if the criterion of experience is accepted, there is no basis to speak of the '(deep) structure of the world', since, first, experience can only provide an observer with information about the way in which reality *appears* (to that observer), and, second, there is no reason to presume that it would be warranted to deny that the microphysical level is (or at least may be) part of 'reality'. So if it is granted that the truth of the PNC does not extend to that level, it is also granted that the PNC is not (or at least may not be) a fundamental metaphysical principle.

It is not justified to conclude, on the basis that it is justified to say that the PNC is true in (a set of) certain cases, that it *must* be true in all (types of) cases. Such a conclusion would, ironically, be based on *inductive* reasoning. Perhaps certain propositions in which the PNC is expressed may be said to be a priori true while others, whose truth cannot be determined a priori, stand in need of an empirical justification, on the basis of which it is to be determined whether they are true or not.[10]

It cannot be ruled out that the results produced in quantum mechanics may somehow be explained[11] by a future theory *without* the need to reject the PNC, but the relevant issue is that a reluctance to reject it on the mere basis that one is unable to understand how it may not be true in certain cases is unwarranted and may be said to be a case of faulty generalization (and an *argumentum ad ignorantiam*). In addition, one cannot appeal to the PNC by stating that accepting a proposition and one that is its contrary conflicts with this principle without begging the question (cf. Priest 2006, 9).

The fact that the (ubiquitous) truth of the PNC cannot be taken for granted brings with it that there is a basis to question the truth of the liar paradox, since it is predicated on the problematic nature of contradictions. Still, this is too weak a basis to be able to conclude that the liar must be dismissed. An alternative approach will therefore be explored in the next section.

4 The Truth and/or Falsity of the Liar Paradox

In the wake of what was said in the previous section, I will not presume that the PNC may be discarded, at least not with respect to the evaluation of the liar paradox. One may *doubt* whether the principle is—generally—true, but this is an insufficient basis to conclude that the PNC is not problematic for the liar paradox. I will instead attempt to solve the paradox on the basis of a semantic inquiry.

A representative semantic paradox is the sorites paradox. The sorites paradox is—allegedly—produced as follows. Taking away a grain from a heap of (e.g.) salt does not bring with it that the heap ceases to be a heap, so that repeating the action

[10] Cf., in a different context, Restall (1993, 296, 297): "There's no difficulty with a deviant saying that the classical account is right as far as these *instances* of classical laws are concerned. It is the illicit generalisations that are mistaken.".

[11] Leaving the issue here how 'explaining' is to be interpreted.

would not have that effect, either, while the heap will disappear if the process is repeated sufficiently long, the heap ultimately being reduced to a single grain.

Importantly, neither 'heap' nor 'grain' is (precisely) defined. With respect to 'grain', the following may be observed. Suppose a grain were divided into parts, until one would (theoretically) have an atom. The question at what point one could no longer qualify the item as a grain is arbitrary. One might claim that no grain remains the first time it is divided into two or more 'sub-grains', but this would raise the—opposite—issue of defining the upper limit of a grain, presenting the difficulty to make it clear why a grain that is larger than average (and that may thus be divided into two or more average, or 'normal', grains) should, just as an average grain, be deemed a grain (rather than a 'super-grain').

With respect to 'heap' (supposing, so as not to complicate matters needlessly, that the issue of the vagueness of 'grain' is not even raised): taking away a grain from a heap does not alter the fact that what remains is still a heap (albeit a (slightly) smaller one). Suppose one continues this process until a single grain remains and then starts adding grains until a (new) heap has been realized. At what point can a heap (again) be identified? If the same argument is used, a heap can never come into existence, for in this case, a single grain does not make a difference, for the same reason why taking away one from an existing heap has no effect.

Yet if one collects a sufficient number of grains and then shows the result to someone who was not present during the process of collecting them, he will, when asked what he sees, respond that there is a heap. The term 'sufficient' is the operative word here: since 'heap' is a vague term, whether a collection of grains is identified as a heap depends on the judgment of the beholder.

The same applies in the original case, where one starts with a (presumed) heap and takes away one grain at a time. One person may say that there is not even a heap to begin with, while another will qualify what he observes as a heap but hold that at some time between that time and the moment only one grain remains it would be unjustified to speak of a heap anymore.

In the case of the sorites paradox, the lack of clarity regarding the meaning of 'heap' (and 'grain') is decisive. It results in a different interpretation from one case to the next and in particular from one person to the next. Once it has become clear that the meaning of the items is the crucial issue, it may be resolved on the basis of a semantic analysis. The sorites paradox is, then, only *seemingly* a paradox.

In the case of the liar paradox, a semantic solution may also be attempted. In the case of the strengthened liar paradox, "This statement is not true", the first question in determining whether the statement results in a paradox, the proposition being both true and not true, is what makes a statement true. Irrespective of whether one adheres to the correspondence theory of truth or to the coherence theory, a statement's truth depends on something other than what may be inferred on the mere basis of the terms that are used, unless, perhaps, if a tautology or contradiction is concerned, but neither are produced in this case, so what has been observed about the PNC in Sect. 3 is not even relevant here.

For example, the statement "The capital of Wyoming is Los Angeles" is not true. It is not self-referring since it refers to something external to itself (namely, the state of affairs in which the capital of Wyoming is Los Angeles), which can be

determined to be true or not true, and it is in fact not true. In the case of "This statement is not true", by contrast, the question arises *what* is said to be not true. Given the structure of the statement, the statement *itself* is presumed to be not true. In what respect, however, is it supposed to be not true (*as well as* true)? Suppose one says: "This statement is pungent". What is said is neither true nor not true, since smelling or tasting has nothing to do with the statement: it cannot be determined to be true or not true. Incidentally, the statement may in one sense of course be determined to be not true: the statement does not smell or taste like anything, so that it is not pungent.

It is clear that the liar paradox cannot be resolved this easily, but a similar approach may prove to be worthwhile. The statement "This statement is not true" must refer to *something* (a state of affairs) in order to be able to determine that it is (not) true, but that complement is lacking. Since it is lacking and therefore not part of what is expressed, neither the truth nor its opposite is at issue. The statement "This statement is not true" is not a paradox or—at best—a stunted one, for what it denies is the truth of something that is not expressed and thus not referred to. By contrast, "This statement, that the capital of Wyoming is Cheyenne, is not true", *is* a paradox, something which is true is expressed, namely, that the capital of Wyoming is Cheyenne, while, at the same time, something that is not true is said, since that is (also) what is expressed by the statement.

The difference between the liar paradox and the example in which a true statement *is* expressed—and which *is* a (genuine) paradox—may be clarified in the following way. Both "This statement is not true" and "This statement, that the capital of Wyoming is Cheyenne, is not true" have the following form: "This statement is not true with respect to X". In the latter case, there is no doubt what 'X' says. In the case of the liar paradox, conversely, 'X' has no content. The lack of content is problematic as it is a necessary condition for the truth (and falsity) to become apparent.

For completeness I remark that 'this statement' in "This statement, that the capital of Wyoming is Cheyenne, is not true" must be taken to refer to the statement itself and not to another one (which has been made before, by someone else, in which case 'that' instead of 'this' could be used (so with the result 'that statement'); if the speaker *were* to refer to the statement (that the capital of Wyoming is Cheyenne) someone else made, he would, by saying that that statement is not true, be mistaken, but not express a paradox. Incidentally, "This statement is not true" may, one might retort, in one sense be said to be a paradox, namely, in the sense that no statement is expressed, so that the term 'statement' would be out of place, but that objection may be refuted by pointing out that the absence of a statement attests to the absence of a paradox in this case, too.

The lack of truth or falsity follows from the given that no statement is made, so that the issue of whether it may be true or not true does not present itself. This is a welcome outcome, since the alternative approach to 'truth' with respect to the liar paradox that consists in maintaining that a hierarchy of different levels of truth values exists appears difficult to uphold, as becomes apparent from Walker's analysis (Walker 2004, 105).

To someone who might object that it appears that I have presented my account by surreptitiously accepting the correspondence theory of truth without wanting to consider the alternative of the coherence theory I would respond as follows. On the

basis of the correspondence theory of truth, the statement "This statement is not true" does not constitute a paradox. If, by contrast, the coherence theory is accepted, it might seem that, contrary to what I have argued, a paradox *is* realized. Still, in this case, the statement's truth would still have to be determined on the basis of what is apparent from *other* statements or beliefs, so that the paradox cannot be inferred to exist on the basis of the analysis of the statement itself here, either.

The proposed solution to the liar paradox is a semantic one, then, but not of the same kind as the one I offered in the case of the sorites paradox, since the issue is not that the meaning of one or more elements is unclear but that it is absent. The liar paradox has the potential to be meaningful, but only if a state of affairs is referred to.

There are similar approaches to the liar paradox, but the solution that has been proposed here differs from them in the following respects. A perspective according to which (the absence of) the speech act aspect is the vital issue does not address the paradox itself. Such a perspective becomes apparent in Martinich's approach, who points out that the essential condition for making a statement is not fulfilled through the liar paradox: "The essential condition for making a statement is that the speaker intends that the audience will take his utterance as representing how things are. But a speaker cannot have this intention if he utters (L [This statement is false]) and knows what it means" (Martinich 1983, 63).

Goldstein, similar to Martinich but presenting his account in terms of semantics instead of pragmatics, argues that no one would actually stand by what is expressed through the liar paradox (Goldstein 1985, 12). Accordingly, "A person who purports to make a candid assertion of a Liar sentence does not share our ways of thought and talk" (Goldstein 1985, 12).

To what has been advanced in this section I can add, for completeness, that it should now be clear that the question of whether the PNC is true is irrelevant for the present inquiry: if no statement is made through the liar paradox, no contradiction manifests itself to begin with. In other words, the liar paradox should not be taken to be symbolically expressible as '¬ (p ∧ ¬ p)' and not even as '¬ p'.

The liar paradox, I maintain, is neither true nor not true, since there is no paradox to begin with,[12] but if one insists on using the term, the paradox is an underdeveloped one.

5 Conclusion

I have argued that the liar paradox is a paradox in name only. It has the *potential* to be a paradox, a potential that cannot be realized unless it is complemented with something on the basis of which its truth (and its opposite) is expressed. As long as is this complement is lacking, nothing is said which can be determined to be true or not true. The statement "This statement is not true" is itself of course said to be true

[12] One may observe, accordingly, that no problem exists in the first place (cf. Wittgenstein (1984 [1921], par. 4003): "… es ist nicht verwunderlich, daß die tiefsten Probleme eigentlich keine Probleme sind." ("It is not surprising that the deepest problems are really no problems.")).

(and not true), but this makes no sense, precisely for the reason that it does not refer to something whose truth may be corroborated. What is expressed in the liar paradox is neither true nor not true, simply because no statement is made that amounts to a truth claim.

For the same reason, the contradiction that is allegedly part of the (so-called) paradox does not come to fruition. It was not necessary, accordingly, to engage to a great extent with the truth of the PNC. The purpose of what was presented preliminarily to the analysis of the liar paradox itself was to ensure that problematizing the PNC would not be sufficient to solve the paradox; had it turned to be sufficient, after all, what was said in Sect. 4 would have been redundant, or at least significant.

That such a conclusion cannot—still—be reached is my assessment, which I hope to share with the reader. It is not the most sophisticated of the analyses and solutions of the paradox that have been produced; neither the need nor the desire presented itself to ask more of the reader's patience than what has already been demanded on the basis of the present text, which I consider sufficient for the relatively straightforward inquiry of my relatively simple interpretation of the (so-called) paradox.

Declarations

Ethical approval The author assures that for this manuscript the following is fulfilled: his material is the author's own original work, which has not been previously published elsewhere. The paper reflects the author's own research and analysis in a truthful and complete manner. All sources used are properly disclosed.

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